Space Weather Forecast

Issued on Friday, 07 April 2023 at 12:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares (R1-R2; Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with the largest flare a mid-Common class event from a sunspot region in the far southwest. Overall there are three sunspot groups on the visible disc. The largest and most complex region is located in the far southeast, having recently rotated over the eastern limb. Much of the magnetic complexity in the region in the far southwest has now faded and the region appears to be reducing in size. The other group near the northwest limb is a small, magnetically simple region.

Around 07/0800 UTC a modest-sized filament lifted off from an area around S35W00. Although the liftoff does not appear particularly energetic, there may be an Earth-directed component given its location along the Earth-Sun meridian. We await further coronagraph imagery in order to assess if the associated Coronal Mass Ejection (CME) may become geo-effective. No other Earth directed CMEs have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind was initially at Background levels (around 380km/s) but increased to Slightly Elevated levels from around 06/1930 UTC. Winds have remained around 400-420km/s since then. Magnetic field strength has been weak throughout, with the important north-south component varying weakly. Geomagnetic activity has been Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: High energy protons have been at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is most likely to be Low, but with a chance of Moderate activity, most likely resulting from the new region in the southeast of the visible disc, or from the other relatively active region in the southwest. Other regions may emerge across the northeastern limb during the period to potentially supplement the existing flare risk.

Solar Wind / Geomagnetic Activity: A filament eruption around 0800 UTC on 07 Apr from approximately S35 W00 is awaiting further solar imagery to determine if there is an Earth-directed component. Otherwise, there are no Earth-directed CMEs expected. Wind speeds are likely to mainly be at slow-ambient levels during the period, but could increase to Slightly Elevated levels on Day 4 (10 Apr), given the anticipated connection to a coronal hole high-speed stream.

Geomagnetic activity is expected to mainly be Quiet to Unsettled, with a slight chance of Active periods or G1/Minor Storm intervals on Day 4.

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Energetic Particles / Solar Radiation: Solar radiation storms are unlikely through this period, although there is a very slight chance of reaching the Minor Storm level should a more significant flare occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	3	3	3	3

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	3	3	3	3
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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